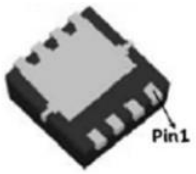
Features

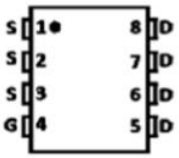
- 30V, 50A
- $R_{DS(ON)}$ = 4.7mΩ (Max.) @ V_{GS} = 10V
- $R_{DS(ON)}$ = 10mΩ (Max.) @ V_{GS} = 4.5V
- Ultra-low Gate charge(Typical 25nC)
- Low Gate Charge
- Low Reverse Recovery Charge
- Fast Switching

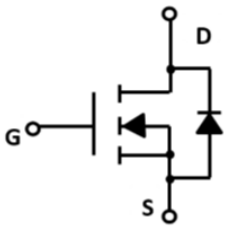
Application

- Load Switch
- PWM Application

Package







PDFN3.3x3.3-8L
SFI50N03AT

Absolute Maximum Ratings T_C=25℃ unless otherwise specified

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	T_C = 25℃	50	A
		T_C = 100℃	40	A
I_{DM}	Pulsed Drain Current note1		200	A
E_{AS}	Single Pulsed Avalanche Energy note2		270	mJ
P_D	Power Dissipation	T_C = 25℃	50	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.5	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

*Drain current limited by maximum junction temperature

Electrical Characteristics T_C=25℃ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note2	V_{GS} = 10V, I_D = 30A	-	3.5	4.7	mΩ
		V_{GS} = 4.5V, I_D = 20A	-	7	10	
g_{FS}	Forward Transconductance	V_{DS} = 5V, I_D = 15A	-	28	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz	-	2153	-	pF
C_{oss}	Output Capacitance		-	327	-	pF
C_{rss}	Reverse Transfer Capacitance		-	287	-	pF
Q_g	Total Gate Charge	V_{DS} = 25V, I_D = 30A, V_{GS} = 10V	-	45	-	nC
Q_{gs}	Gate-Source Charge		-	3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	15	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 15V, I_D = 30A, R_{GEN} = 3Ω, V_{GS} = 10V	-	21	-	ns
t_r	Turn-On Rise Time		-	32	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	59	-	ns
t_f	Turn-Off Fall Time		-	34	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =30A	-	-	1.2	V
t_{rr}	Reverse recovery time	I_F=20A, dI/ dt =100 A / μs	-	15	-	ns
Q_{rr}	Reverse recovery charge		-	4	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: TJ=25℃, V_G=10V, R_G=25Ω, L=0.5mH
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

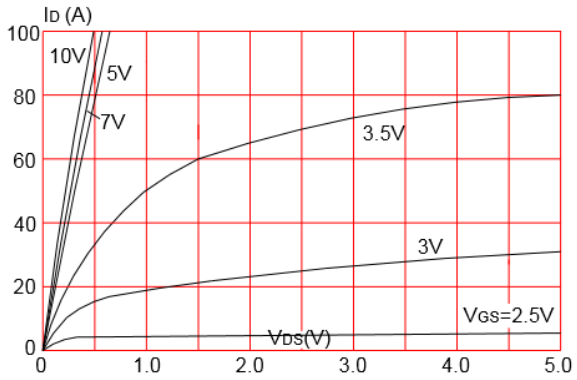


Figure 1. Output Characteristics

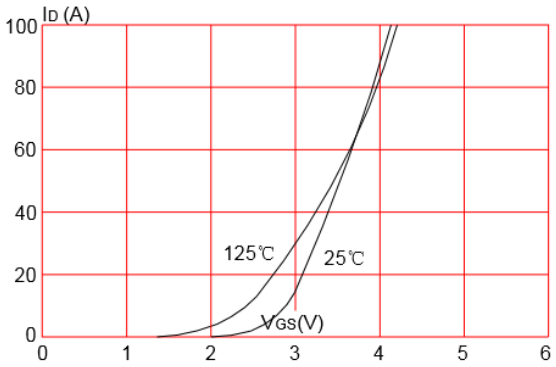


Figure 2. Typical Transfer Characteristics

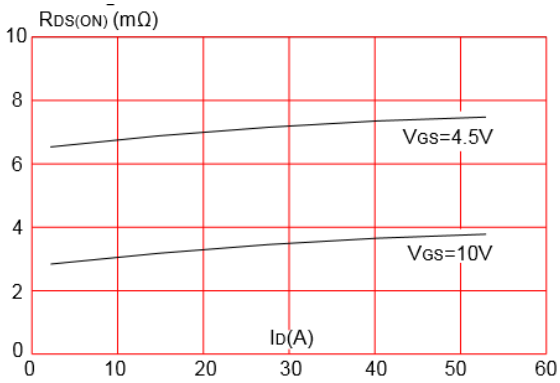


Figure 3. On-resistance vs. Drain Current

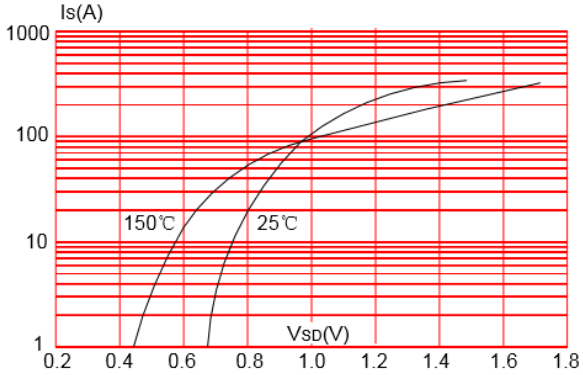


Figure 4. Body Diode Characteristics

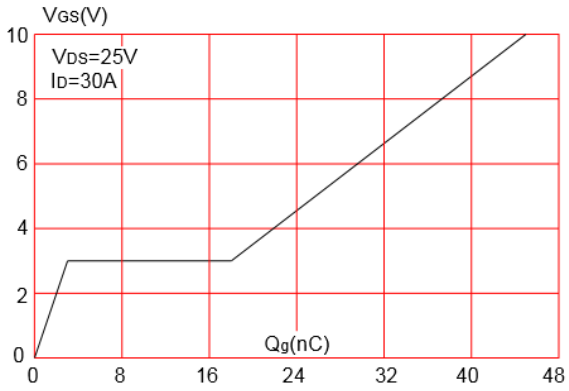


Figure 5. Gate Charge Characteristics

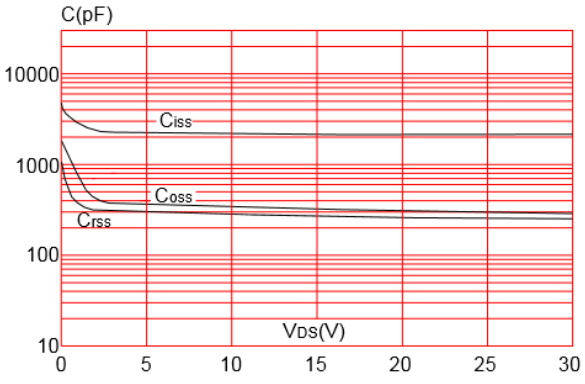


Figure 6. Capacitance Characteristic

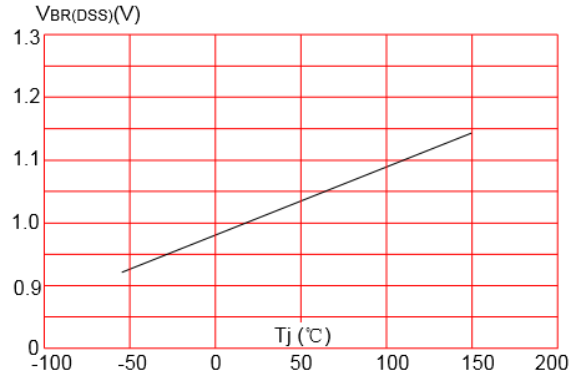


Figure 7. Normalized Breakdown Voltage vs. Junction Temperature

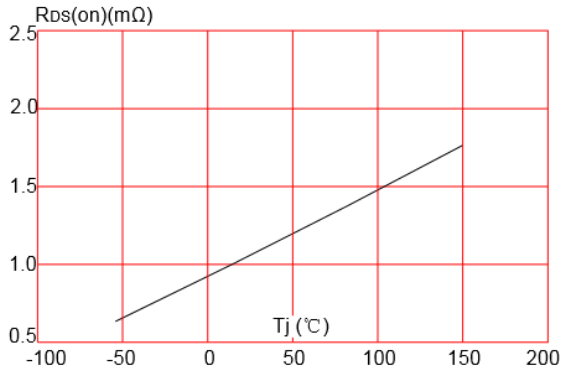


Figure 8. Normalized on Resistance vs. Junction Temperature

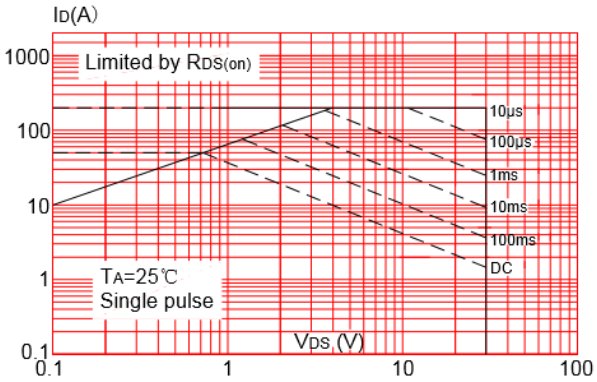


Figure 9. Maximum Safe Operating Area

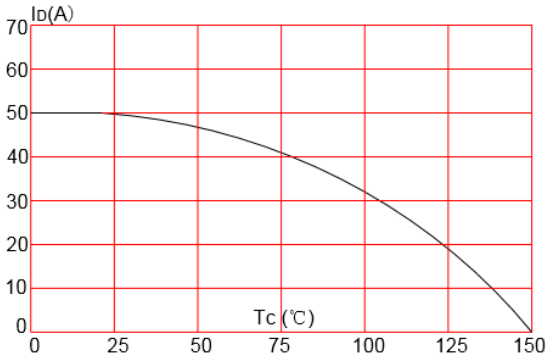


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

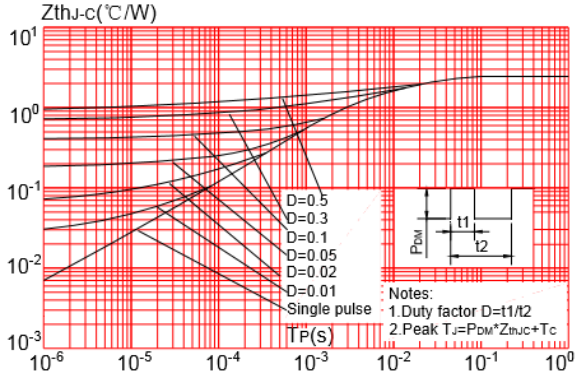


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

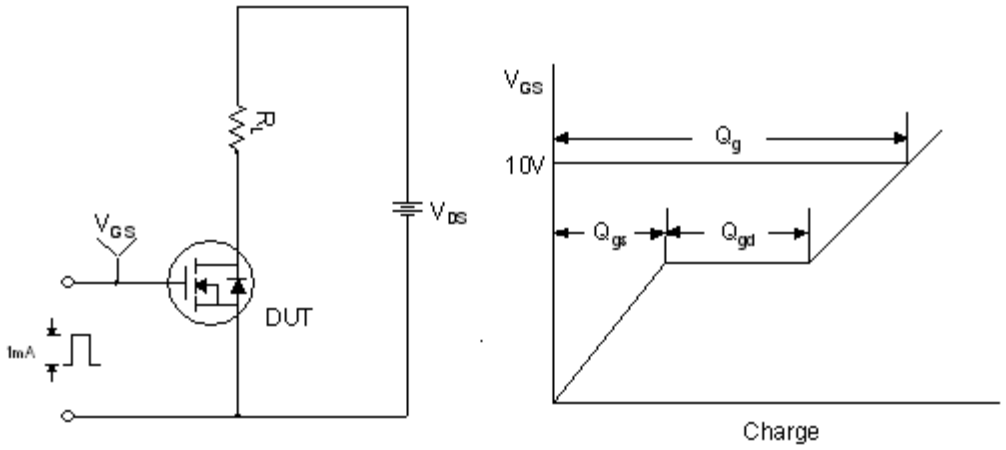


Figure 12. Gate Charge Test Circuit & Waveform

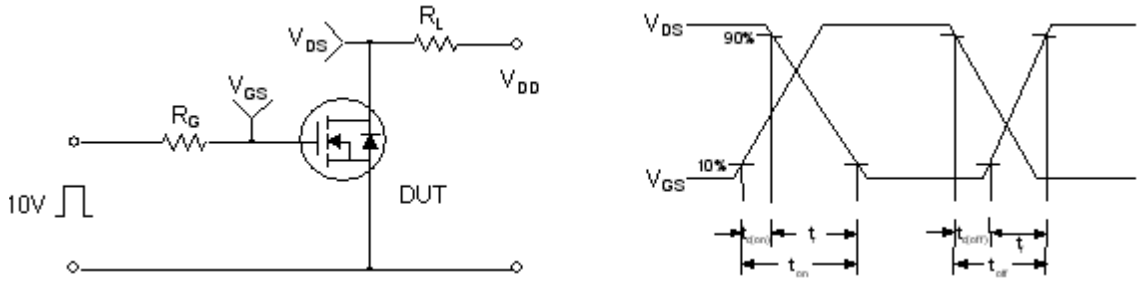


Figure 13. Resistive Switching Test Circuit & Waveforms

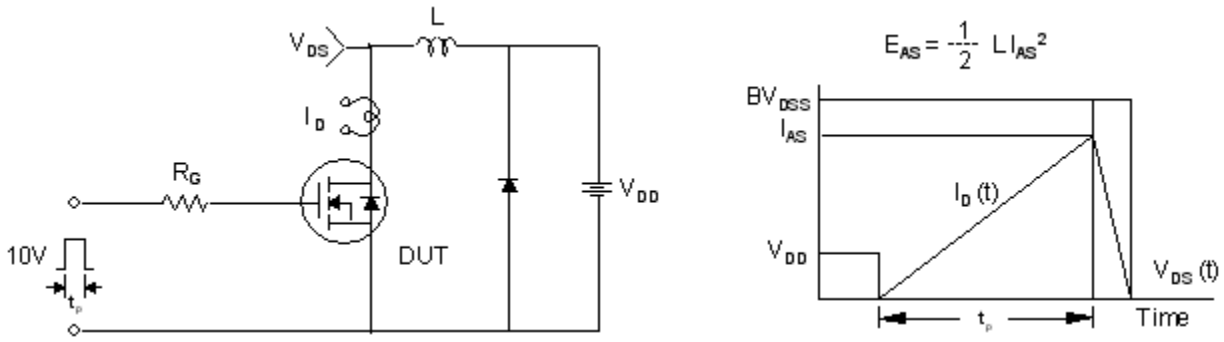


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

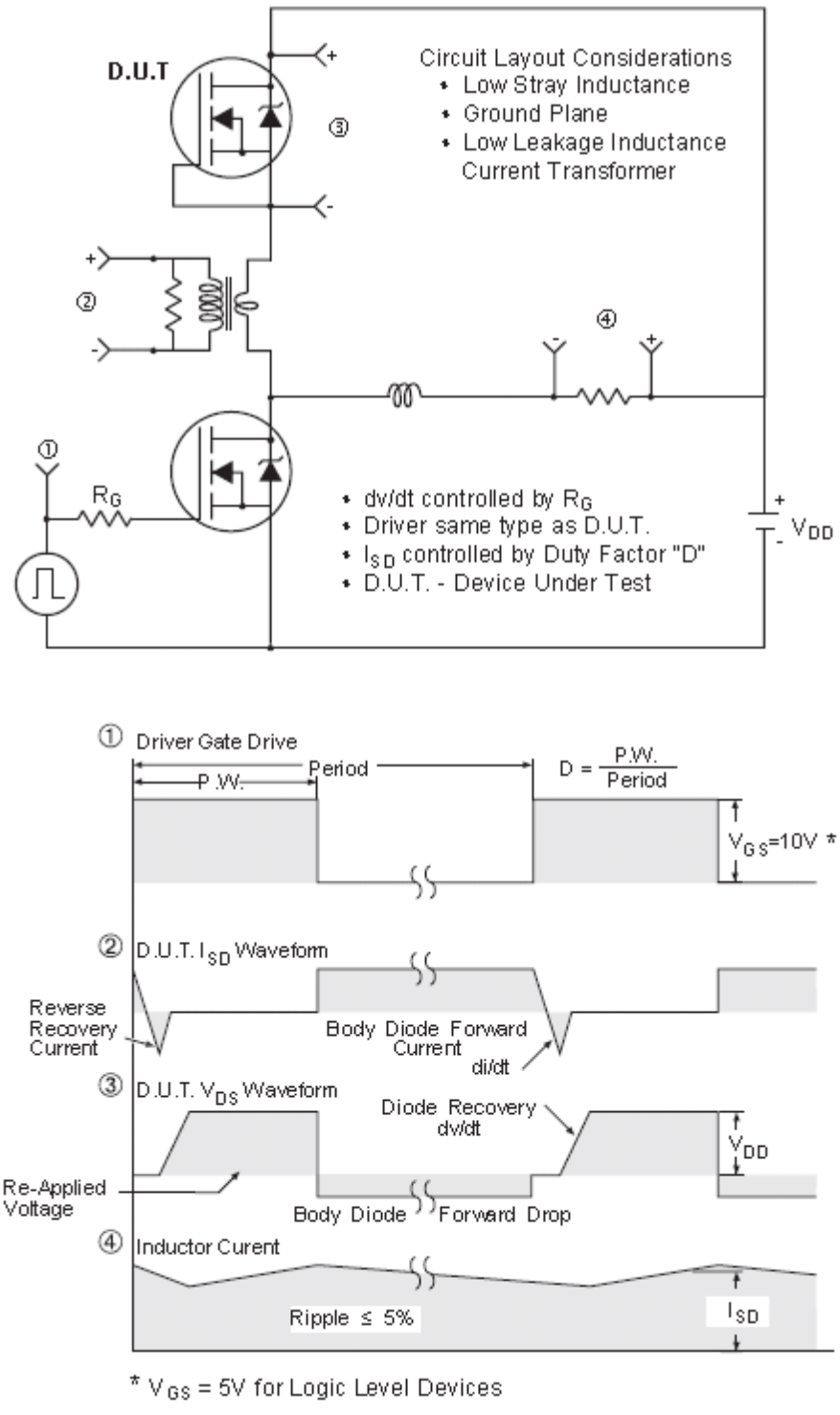
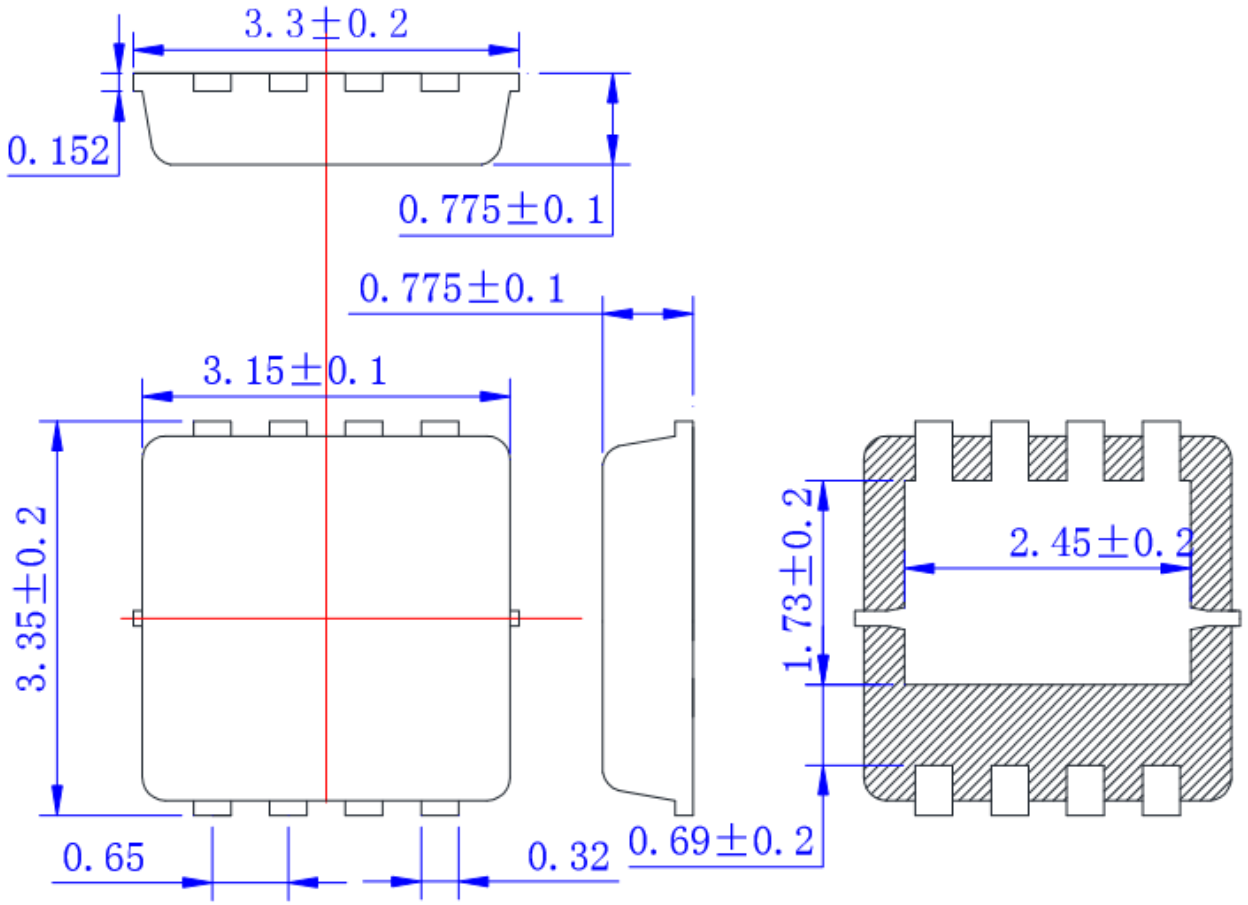


Figure 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

PDFN3.3x3.3-8L Package Mechanical Data



NOTE:

1.We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don't be hesitate to contact us.

2.Please do not exceed the absolute maximum ratings of the device when circuit designing.

3.Winsemi Microelectronics Co., Ltd reserved the right to make changes in this specification sheet and is subject to change without prior notice.

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